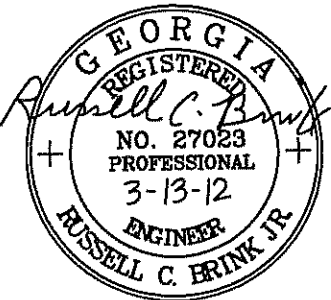


REVISION

DATE	NO.	DESCRIPTION
12/14/07	A	SUBMIT TO DOT FOR REVIEW
01/07/08	B	RESUBMIT TO DOT FOR REVIEW
01/21/08	C	REVISED AS PER DOT REVISIONS
02/11/08	D	RESUBMIT TO DOT FOR REVIEW
03/13/12	E	RESUBMIT TO DOT FOR REVIEW



SECTION 02225

EARTHWORK FOR UTILITIES

PART 1 GENERAL

1.01 SCOPE OF WORK

Work under this section shall include all operations necessary for excavating, backfilling and compaction of material necessary for the construction of pipelines and all appurtenant facilities including sewage pump station, concrete saddles, pipe protection, etc., and for the disposal of waste and unsuitable materials.

1.02 RELATED WORK

A. Section 02660 Water Distribution Systems

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM), American Water Works Association (AWWA), Annual Book of Standards

1. ASTM D2167, Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method

2. ASTM D1556, Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method

3. ASTM D 2321, Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.

4. AWWA C600, Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances.

5. N/A

6. AWWA C150, American National Standard for the Thickness Design of Ductile-Iron Pipe

7. ASTM D2487, Standard Practice for Classification of Soils for Engineering Purposes

B. Occupational Safety and Health Administration (OSHA), Code of Federal Regulations 29 CFR Part 1926, Subpart P – Excavation, latest revision.

1.04 GENERAL

Elevations of the existing ground and the elevations of existing grades of structures are believed to be reasonably correct, but do not purport to be absolutely so, and, together, with any schedule of quantities are presented only as an approximation. The CONTRACTOR shall satisfy himself, however, by actual examination of the site of the WORK as to the existing elevations and the amount of work required under this section. If the CONTRACTOR is not willing to accept any ground surface elevations indicated upon the Drawings for payment, he shall so notify the ENGINEER prior to starting any excavation work.

PART 2 PRODUCTS

2.01 BEDDING AND HAUNCHING STONE

A. Class 1A or 1B aggregate materials in accordance with ASTM D 2321 for gravity sewer, wet trench conditions, under roads, structures and driveways.

2.02 INITIAL BACKFILL

Reused or imported earth free of stone, clods, broken rock, or concrete ,or organic matter, rubbish, or other unsuitable material.

2.03 FINAL BACKFILL

Reused or imported earth free of stone, clods, broken rock, or concrete larger than 3 inches in largest dimension, or organic matter, rubbish, or other unsuitable material.

PART 3 EXECUTION

3.01 INSPECTION

A. Verify bedding and backfill material to be used are acceptable. Do not use frozen material.

B. Verify areas to be backfilled are free of debris, snow, ice, or water, and surfaces are not frozen.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. When necessary, compact subgrade surfaces to density requirements for backfill material.

3.03 SHEETING, SHORING AND BRACING

A. CONTRACTOR shall be responsible for supporting and maintaining all excavations required even to the extent of sheeting and shoring the sides and ends of excavations with timber or other supports. All sheeting, shoring and bracing shall have sufficient strength and rigidity to withstand the pressure exerted and to conform with OSHA 29 CFR 1926, Subpart P – Excavations, latest revision.

B. Excavations adjacent to existing or proposed utilities, buildings and structures, or in paved streets or alleys shall be sheeted, shored and braced adequately to prevent undermining beneath or subsequent settlement of such structures or pavements. Underpinning of adjacent utilities and structures shall be done when necessary to maintain utilities and structures in safe condition. The CONTRACTOR shall be held liable for any damage resulting to such utilities, structures or pavements as a result of his operations.

C. The need and adequacy of sheeting, shoring, bracing, or other provisions to protect men and equipment in a trench or other excavation shall be the sole and exclusive responsibility of CONTRACTOR.

D. Moving trench boxes or sheeting: When using moveable trench support, care should be taken so not to disturb the pipe location, joints, or embedment. Removal of any trench protection below the top of the pipe and within the dimensions of the trench shown on the construction details (for Class 2, 4, and 5 Bedding) shall be prohibited after pipe embedment is compacted. Therefore, moveable trench supports shall only be used in wide trench construction where supports extend below the top of the pipe, or on a shelf above the pipe installed in a narrow trench in accordance with construction details. Any voids left in the embedment material by support removal shall be carefully filled with Class 1A or 1B aggregate materials and compacted.

SECTION 02225 EARTHWORK FOR UTILITIES (CONT'D)

3.04 EXCAVATION

A. Trench Excavation

1. Trench excavation shall consist of the removal of materials necessary for the construction of pipelines and all appurtenant facilities including collars, concrete saddles, and pipe protection called for on Drawings.

2. Excavation for pipelines shall be made in open cut unless otherwise shown on Drawings. Trenches shall be cut true to lines and grades shown on Drawings. Minimum pipe cover shall be 48" measured from the top of pipe to the ground surface.

3. Use of motor-powered trenching machine will be permitted but full responsibility for the preservation, replacement, and/or repair of damage to any existing utility services and private property shall rest with CONTRACTOR.

4. Bell holes for bell and spigot pipe and/or mechanical joint pipe shall be excavated at proper intervals so the barrel of the pipe will rest for its entire length upon the bottom of the trench or bedding material.

5. Pipe trenches shall not be excavated more than 400 feet in advance of pipe laying and all work shall be performed to cause the least possible inconvenience to the public. Adequate temporary bridges or crossings shall be constructed and maintained where required to permit uninterrupted vehicular and pedestrian traffic.

6. Unless otherwise specified herein or shown on Drawings, wherever pipe trenches are excavated below elevation shown on Drawings, CONTRACTOR, at his own expense, shall fill the void thus made to proper grade with bedding and haunching material in accordance with Part 2.01A.

7. In all cases where materials are deposited along open trenches they shall be placed so that no damage will result to the WORK and/or adjacent property in case of rain or other surface wash.

8. Remove soft, spongy, or otherwise unstable materials encountered at elevation of pipe which will not provide a firm foundation for the pipe. Extend bedding depth as necessary to reach firm materials.

B. Any unauthorized excavation shall be corrected at the CONTRACTOR's expense.

C. Protect bottom of excavations and soil adjacent to and beneath foundations from frost.

D. Grade top perimeter of excavation to prevent surface water run-off into excavation.

E. Notify ENGINEER of unexpected subsurface conditions and discontinue work in affected area until notification to resume work.

F. Trench widths shall be in accordance with construction details for Class 2, 4, and 5 Bedding.

3.05 DEWATERING

A. CONTRACTOR shall provide and maintain at all times during construction, ample means and devices with which to promptly remove and properly dispose of all water from any source entering the excavations or other parts of the WORK. Dewatering shall be accomplished by methods which will ensure a dry excavation and preservation of final lines and grades of bottoms of excavations. Methods of dewatering may include sump pumps, well points, deep wells, or other suitable methods which do not damage or weaken structures, foundations, or subgrades. Shallow excavations may be dewatered using open ditches provided such ditches are kept open and free-draining at all times. Dewatering methods used shall be acceptable to ENGINEER. Footing pits or trenches shall be protected by small earth dikes and plastic covers when they are left open in rainy weather.

B. When significant (more than 30 L.F. continuously in a trench) ground water is encountered in soils containing fines, the CONTRACTOR shall notify the ENGINEER. In these areas, the trench shall be lined with an approved filter fabric between the bedding and haunching material and the trench walls to reduce the effects of migration of fines which can diminish pipe support.

C. Unless specifically authorized by ENGINEER, groundwater encountered within the limits of excavation shall be depressed to an elevation not less than twelve (12) inches below the bottom of such excavation before pipe laying or concreting is started and shall be so maintained. No concrete structures shall be exposed to unequal hydrostatic forces until the concrete has reached its specified 28-day strength. Water shall not be allowed to rise above bedding during pipe laying operations. CONTRACTOR shall exercise care to prevent damage to pipelines or structures resulting from flotation, undermining, or scour. Dewatering operations shall commence when ground or surface water is first encountered and shall be continued until such times as water can safely be allowed to rise in accordance with provisions of this section.

D. Standby pumping equipment shall be kept on the job site. A minimum of one standby unit (one for each ten in the event well points are used) shall be available for immediate installation should any pumping unit fail. Installation of well points or deep wells shall be adequately sized to accomplish the WORK. Drawings or design of proposed well point or deep well dewatering systems shall be submitted to ENGINEER for review.

E. CONTRACTOR shall not operate dewatering devices (i.e., pumps, etc.) before the hour of 8:00 AM and after the hours of 8:00 PM in a residential area unless otherwise approved by ENGINEER or OWNER.

F. If foundation soils are disturbed or loosened by the upward seepage of water or an uncontrolled flow of water, the affected areas shall be excavated and replaced with foundation backfill at no cost to OWNER. Foundation backfill shall be placed in bottom of trench to within 6" of the bottom of pipe. Six (6) inches of bedding stone shall be placed over the top of the foundation backfill.

G. CONTRACTOR shall dispose of water from the WORK in a suitable manner without damage to adjacent property. Conveyance of water shall be such as to not interfere with construction operations or surrounding property owners. No water shall be drained into WORK built or under construction without prior consent of ENGINEER. CONTRACTOR will be held responsible for the condition of any pipe or conduit which he may use for drainage purposes, and all such pipes or conduits shall be left clean and free of sediment.

H. Storm water runoff shall be controlled by means of temporary erosion control methods specified in Section 02270, as shown on Drawings, or as directed by ENGINEER.

I. Water shall be disposed of in such a manner as not to be a menace to public health and in accordance with applicable Environmental Protection Agency, Corps of Engineers, and State Environmental Protection Division standards and permits.

3.06 BEDDING/BACKFILLING

A. The backfilling of trenches shall be started immediately after construction of same has been viewed by the Project Observer. Bedding shall be aggregate and backfill material shall be earth or aggregate in accordance with Part 2 and the Drawings. Material shall be deposited in the initial horizontal layer to the spring line of the pipe (before compaction) on each side of the pipe. The initial layer shall be thoroughly tamped or rammed around the pipe until the initial layer's density is equal to the density of the adjacent undisturbed soils. The second bedding material layer shall be deposited horizontally to a depth to provide a cover of not less than 12 inches over top of pipe. The remainder of the backfill shall be placed in horizontal layers 18 inches (maximum) in depth. The second and subsequent bedding/backfill layers shall be compacted by compaction tools to a density equal to the density of the adjacent undisturbed soils, except under roads, structures, and driveways.

B. Compact aggregate and soil backfill under roads, parking lots, structures, and driveways to a minimum of 95% of maximum dry density at not less than 2% below nor more than 2% above the optimum moisture content as determined by ASTM D 698. The top 12 inches shall be compacted to 100 percent of maximum dry density. Consolidation by saturation or ponding will not be permitted.

C. All backfilling shall be done in a manner that the pipe or structure over or against which it is being placed will not be disturbed or injured. Any pipe or structure injured, damaged or moved from its proper line or grade during backfilling operations shall be removed and repaired to the satisfaction of OWNER and then re-backfilled.

SECTION 02225 EARTHWORK FOR UTILITIES (CONT'D)

3.06 BEDDING/BACKFILLING (CON'D)

D. Backfilling shall not be done in freezing weather except by permission of the ENGINEER, and shall not be done with frozen material or upon frozen materials.

E. All backfilling shall be left with smooth, even surfaces, properly graded and shall be maintained in this condition until final completion and acceptance of the work. Where directed by the ENGINEER, the backfill shall be mounded slightly above the adjacent ground.

F. Leave stockpile areas completely free of excess fill materials. After construction and cleanup, stockpile areas shall be seeded in accordance with provisions specified in Section 02931.

G. Use "Class 5" bedding in all wet trenches and under roads/driveways, regardless of pipe material. Use "Class 5" bedding for all PVC gravity sewer.

H. N/A

I. Use "Class 2" bedding for DIP waterline/pressure lines.

END OF SECTION

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	BRST-074-1(51)	56	119